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ABSTRACT

With the prospect of less funds for vocational education, an innovative human resource development plan is needed to provide for improved and new training programs. Vocational teachers and administrators with curriculum development and management competencies will be required to develop curricula. Instructors will need to familiarize themselves with curriculum sources. As one part of the human resource development plan, instructors recruited from industry, vocational teachers and administrators, and students in teacher preparation programs will need to develop or upgrade skills in curriculum development and management. Vocational educators must be trained to use the best and most current curriculum as part of the human resource development plan. A knowledge utilization system is needed in which vocational instructors can gain access to the best available vocational curricula. A training program, vocational education curriculum specialist (VECS), has been field tested and found effective in creating or upgrading vocational education curriculum development and management skills (see note). The 17 competency-based modules in the program are appropriate for all instructional settings and teaching methods. (Project descriptions show how five field test sites used the modules.) Target populations range from undergraduate students to graduate students and practicing teachers and administrators. (YLB)

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Adapting Vocational Education to the 80's Through Human Resource Development[1]

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U.S. DEPARTMENT OF EDUCATION
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The Need for Change

Priot to the recent decrease in federal support, vocational education functioned with little attention to either the public or the pocketbook. In yesterday's era of growth, more of everything--vocational education included--was the rule. Questions about costs and consequences usually were ignored or deferred. That era of ever-increasing growth is over. However, because acknowledging and adapting to change is a hallmark of the vocational education community, we can look forward confidently to the transition from the old to a new era.

Janssen (1980) has suggested some points that educators ought to consider as they plan ways to alter the attitudes of those who work in an environment of decline or retrenchment. He lists some factors that can help to neutralize or minimize the impact of limits. Among his suggestions are: (1) provide psychological freedom for staff members, (2) attempt to prevent problems through participatory activity, (3) seek out and emphasize untapped and creative potential, (4) engage in a thorough redefinition of problems as they have been altered by the declining environment, and (5) attempt to provide vehicles that will integrate effort through cooperation and mutual activity.

This article presents a strategy--human resource development--that will make vocational education adaptive to the 80's by utilizing the above principles.

Human Resource Development: The Adaptive Process

With funds for vocational training programs promising to be in short supply for the indefinite future, how can current training programs be improved and new ones developed in order to supply the skilled workers our nation needs? This question can be divided into two more specific ones: (1) who will prepare the curriculum for these new and improved programs? and (2) how will the instructors who must implement the new programs learn of their availability and gain access to them? Answering these questions calls for the design and implementation of an innovative human resource development plan.

Who will Prepare the Curriculum

A widening of the pool of vocational teachers and administrators who have

curriculum development and management competencies will be required to bring about the necessary increase in new curriculum development activity (Goldston, 1981). However, with fewer funds available than ever before, the numbers of full-time curriculum specialists will decline rather than increase. Furthermore, other types of specialized positions in vocational education will disappear or be combined under single titles.

More will be required of fewer people. Individuals who find themselves assigned responsibilities that bear even remotely on curriculum functions will increasingly be asked to assume curriculum development activities. While this may seem like trying to get the proverbial "blood from a turnip," the situation is by no means hopeless. A large number of vocational professionals can be efficiently retrained, if those responsible for the retraining use professional development programs that have been designed and tested for this specific purpose. One of the few such programs currently available--the VECS (Vocational Education Curriculum Specialist) program--is discussed in greater detail later in this article.

How will Instructors Learn to Use the Curriculum?

The great majority of instructors carry on year after year with sadly outdated curriculum. They, themselves, do not have the instructional and curriculum development skills or time necessary for program improvement. They often do not know that upgraded and new curriculum materials are available to them. These instructors need help in learning to use various regional and national vocational curriculum resource systems that enter and catalog newly developed curriculum products.

Upgrading the vocational education curriculum delivery system by helping local instructors use the very latest in instructional materials would make vocational education programs more efficient and effective without necessarily increasing local budgets. A number of curriculum resource centers, networks, and clearinghouses exist for the purpose of improving the vocational instruction of students. But local instructors may not be familiar with procedures for accessing the various resource systems. This lack of familiarity keeps them from taking advantage of the up-to-date curriculum materials referenced in the systems.

Human Resource Development: Training Vocational Educators to be Curriculum Developers

Nearly 15 years ago, at the time the amendments to the Vocational Education Act of 1963 were being debated in Congressional hearings, considerable discussion focused on the need for improving curriculum in vocational education programs. Following the passage of these amendments in 1968, those who had carried the banner for curriculum reform put out a call for a new kind of curriculum specialist, the vocational education curriculum specialist, whose exclusive duty would be to take charge of all vocational curriculum development and management functions within an educational agency or institution. The vocational education curriculum specialist would work with teachers and advisory committees, compiling suggestions and resources in order to develop new curricula and assist in their implementation.

However, in the ensuing decade and a half, it has become clear that full-time specialists with responsibility only for vocational curriculum are employed at a limited number of instructional materials centers around the country. More typically, as budgets have continued to tighten, many different individuals share the curriculum specialist's responsibilities. They may hold various job titles such as: dean of occupational education; local director for vocational education; department or division director for vocational education; supervisor of occupational education; program supervisor for a vocational education discipline; or principal or assistant principal of a vocational-technical school or area vocational center. It is more evident than ever before that vocational educators at these various levels in the educational hierarchy need curriculum development and management skills.

Even vocational instructors need many of the skills of curriculum specialists. You're an experienced tool and die maker, with plenty of respect within your trade. The local vocational school has asked you to start a program to teach students basic skills in this trade. You like the idea of teaching others, but you've never taught before and you have no idea how to design a curriculum, select instructional materials, or prepare tests of students' achievement. This kind of situation is becoming increasingly common as vocational-technical schools and community colleges recruit more and more instructors

from industry in order to meet the demand for skilled workers. These persons who are recruited from industry may have a wealth of work experience, but they often need help in teaching a program and in managing a curriculum (Evans, 1981).

New or upgraded curriculum development and management skills are used by vocational teachers and administrators in activities such as the following: (1) designing or modifying vocational education programs to provide for individual differences, meet the needs of special students, or meet labor market demands; (2) selecting goals, objectives, and instructional strategies for vocational education programs, and preparing instructional materials; (3) conducting evaluations of vocational curricula; (4) managing a vocational program; (5) facilitating curriculum change; and (6) promoting professional growth and staff development.

The words "curriculum specialist" or "vocational education curriculum specialist" are used as an easy way to refer to any vocational educator with responsibility for major activities related to curriculum development and management at the local, district, institutional, or state level, whether he or she is a "specialist" in the traditional sense or not. Increasingly, all vocational educators are participating, to some degree, in making curriculum development and management decisions and all must be concerned with learning or sharpening the skills necessary to do so. Target groups for curriculum development training can range from these full-time, experienced vocational teachers and administrators, through individuals with occupational specialties desiring to teach their technical skills, to college undergraduates preparing for their first teaching experience.

Human Resource Development: Training Vocational Educators to Use the Best and Most Current Curriculum

The value of getting information out to improve local programs by way of resource systems has been documented by various federally sponsored studies. One such study is a recently completed evaluation of the National Institute of Education's State Dissemination Capacity Building program (NTS Research Corporation, 1981). Among its specific findings, the NTS study reported that

the State Education Agencies (SEAs) need to devote more attention to improving coordination of dissemination programs and resources as well as to institutionalizing the dissemination function. Further, the study concluded that SEAs' efforts to help local educators locate and use current knowledge about new instructional products and practices are limited by poor management in defining who will be responsible for the dissemination function, what linkage models will be used, and how dissemination relates to other program improvement strategies. However, such studies cannot in themselves get local instructors involved in utilizing available instructional materials. Action is needed.

One of the most effective ways to bridge the gap between local practice and what is available in resource networks is to provide information about successful programs or curriculum materials. Federal initiatives to promote knowledge utilization in education have been increasingly evident in the past 15 years. Initially, such initiatives took the form of information clearinghouses, such as the Education Resources Information Centers (ERIC), and the regional education laboratories and R&D centers. These facilities disseminated an expanding bank of knowledge about new educational practices. More recently, however, knowledge utilization strategies have shifted to the establishment of collaborative networks of individuals, organizations, or both. These networks facilitate the transfer of new ideas to the practitioner's setting. Such a shift in strategies has come from the recognition that although effective knowledge dissemination often occurs through one-way communication channels such as information clearinghouses, two-way communication activities may more often lead to the utilization of information (Ball & Anderson, 1977).

Collaborative Curriculum Networks in Vocational Education

Collaborative networks, or linkage systems, typically include the following four functions:

- A knowledge production process, whereby new ideas for program improvement are created by researchers or practitioners.
- A monitoring process, covering the sources of other relevant ideas.
- A linkage or facilitator function, whereby the new ideas are transmitted to new sites.
- Assistance in implementing new practices, if appropriate, in administrative or classroom settings.

Networks have been designed specifically for vocational education curriculum products to assist individuals within state departments of education as well as administrators and teachers in local districts. Among the curriculum networks in vocational education are:

- The National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE)--This is an umbrella organization that coordinates the activities of six Curriculum Coordination Centers (CCCs) across the country. The goals of the NNCCVTE (and, thus, of the individual centers) are to identify curriculum needs; coordinate curriculum development activities; field test and evaluate curriculum products; collect and disseminate information on available materials; collect and disseminate information on products under development; respond to requests for materials and information; and provide inservice training regarding the use of curriculum products.

- The National Center for Research in Vocational Education (NCRVE) Dissemination and Utilization (D&U) Program--The D&U function is concerned primarily with the choice and implementation of research-based products and information by a variety of personnel for use in the improvement of secondary and postsecondary vocational education. The D&U function must also engage in spreading and exchanging products and information to facilitate choice and implementation. During the D&U Program's first three years, 20 products were selected as exemplary, given national visibility through an annual D&U Conference held at the Center, and disseminated for use across the country.

- The Vocational-Technical Education Consortium of States (V-TECS)--This is a group of 18 southern states, the Air Force, and the Navy. The original mission of V-TECS was the systematic development of performance objectives based upon occupational task analyses; the individual member states could then develop their own curricula organized around the competencies. However, in October 1980 the V-TECS Board agreed to expand the original V-TECS focus into the areas of curriculum and instructional materials development; an accompanying priority is to review and refine current competency catalog developmental models and procedures to ensure quality products that are consistent and usable across state lines.

- The Mid-America Vocational Curriculum Consortium (MAVCC)--MAVCC is a non-profit corporation composed of agencies that administer vocational programs in an 11-state area. The organization was established in 1975 as an outgrowth of the NNCCVTE when representatives of these states saw an opportunity to develop mutually needed instructional materials through a joint effort.

For several years, staff of the D&U Program at the National Center for Research in Vocational Education have pursued the goal of encouraging collaboration among all of the networks and centers described on the previous page. Annual conferences of representatives of these and other organizations have been held, and considerable informal sharing of effective strategies has been accomplished. To date, however, local vocational education practitioners have not been provided in any systematic way with concrete, practical strategies for upgrading the quality of instruction in their classrooms.

Possible Strategies

The effective provision of information should not be seen merely as a traditional dissemination activity, in which written curriculum materials are distributed to a passive readership. New information must also be conveyed by means of conferences, training sessions, mutual problem-solving, and extensive interpersonal communications. All of these activities may be considered part of a process now recognized as knowledge utilization (Lindblom & Cohen, 1979).

What is needed is a knowledge utilization system in which vocational instructors in all major disciplines can gain access to, and put into practice, the best available vocational curricula. Quality sources of effective vocational curricula exist. However, the local instructor who needs such materials in order to train students for existing and future high-demand occupations must have a link to these sources. Some have proposed that the state level supervisor or occupational specialist in each of the vocational service areas serve as the linkage agent in this process (OVAE, 1981). But there are a number of issues related to this proposal.

State level occupational specialists are often busy and find it difficult to keep up with current trends in vocational curriculum. During the school year, these specialists typically spend 60-75% of their time consulting with local instructors in the field. This leaves little time to spend on keeping up to date regarding curriculum materials. While they may get to state meetings, they are rarely able to attend national ones. Adding to

their time pressures is the fact that in some states one person has more than one vocational service area to supervise. Also, some supervisors have regular, full-time appointments on university faculties and take on the supervisor's role only as an added task under contract to the state department of education.

To make the knowledge utilization system work, the linkage agent must be well-versed in assessing the needs of local users and in accessing the various curriculum resource networks to meet those needs. To carry out this function effectively, the state level occupational specialist would have to receive training in how to gain access to and utilize the resources available in the various vocational curriculum networks as well as in other, related networks. The training should stress demonstrations and simulations of practical strategies. A dominant theme of the training would be how to work effectively with local instructors in introducing change into the vocational classroom. With such training, the state level linkage agent--whether it is an occupational specialist or some other state program official--would be able to go into the field equipped to help local teachers learn what curriculum products are available to them and how to access them.

Human Resource Development: Availability of Suitable Training Materials

A training program (VECS) designed to serve a broad purpose--creating or upgrading vocational education curriculum development and management skills under a variety of circumstances for all who need or will need these skills--has been field tested nationally and found effective (Claudy & Hamilton, 1981). Each module in the training program was designed on the basis of a survey that asked vocational education researchers and curriculum developers to rate the most important specific skills required by people who design vocational curricula. The contents of each module also stress the need to identify specific skills that vocational students should acquire. In this sense, the modules take a competency-based rather than time-based approach.

Overview of Module Content and Format

Each of the modules in the training program provides a concise presentation of measurable objectives, activities, and information that can either stand alone or serve as a foundation to which activities and readings can be added. In addition, the modules can be adapted to a variety of use patterns. For example, all 17 can be taught in sequence as a program of study, a series or subgroup of modules on one subject area can be used in a course, or individuals may learn from single modules as their needs dictate.

The Introductory Module provides an introduction to all the other modules.

- Module 1: Vocational Educators and Curriculum Management provides an overview of the six major curriculum development and management functions: (1) needs assessment, (2) program design, (c) selection and organization of vocational education program content, (4) coordination of human resources, (5) program implementation, and (6) research and evaluation.

The five modules in the Foundations Series provide an introduction to the history and philosophy of vocational education in the United States and describe current areas of emphasis.

- Module 2: The Scope of Vocational Education describes the evolution of vocational education; briefly considers the philosophical, economic, and sociological concepts underlying the current structure of vocational education; and presents student enrollment data.

- Module 3: Organization of Vocational Education describes the organization and administration of vocational education at the federal, state, and local levels. This module also describes the types of vocational education programs sponsored by secondary and postsecondary schools, area vocational centers, and other agencies. Finally, the module describes the role of the advisory council in vocational education.

- Module 4: Legislative Mandates for Vocational Education describes key factors that affected vocational education legislation between 1917 and 1981.

- Module 5: Priorities in Vocational Education provides an overview of such recent priorities as energy conservation, sex equity, youth employment, and programs for special students. Types of programs providing job experiences to supplement classroom instruction are also discussed here.

- Module 6: Vocational Education for Students with Special Needs discusses recent federal legislation regarding vocational education for students who are handicapped or disadvantaged, who speak limited English, or who are preparing for occupations that are not traditionally held by persons of their sex. The module discusses barriers to equal education faced by special students, and includes guidelines for reviewing and modifying curricula, facilities, and materials.

The five modules in the Curriculum Development Series concentrate on tasks directly related to the preparation of curriculum materials.

- Module 7: Vocational Needs Assessment and Curriculum Development introduces the reader to discrepancy analysis. The module describes methods for evaluating student and labor market needs and shows how information gathered from the needs assessment process can be used to propose a new or improved curriculum.

- Module 8: Conducting Task Analyses and Developing Instructional Objectives is devoted to the derivation and specification of instructional objectives. Derivation includes the location or development of a general job description, analysis of the tasks included in the description, selection of tasks for instruction, description of the target population, and determination of course prerequisites. Specification refers to the detailed description of behaviors expected of students upon completion of instruction and of important conditions under which student behavior is to occur.

- Module 9: Selecting Instructional Strategies and Assessing Student Achievement describes the advantages and disadvantages of eight instructional strategies and discusses the role of criterion-referenced testing. The objectivity, validity, reliability, efficiency, and nonreactivity of tests are also discussed in this module.

- Module 10: Relating Learning Differences and Instructional Methods describes variables that account for individual differences, discusses methods for use in determining students' interests and abilities, and describes strategies for addressing individual differences. Strategies described include selective enrollment, homogeneous grouping, informal variations in teaching methods, remedial instruction, team approaches, and self-instructional materials.

- Module 11: Selecting and Preparing Instructional Materials familiarizes the individual with the resources available to vocational educators and suggests criteria for evaluating instructional materials. The module also discusses the thinking, writing, and editing processes involved in developing effective written materials.

The six modules in the Administrative Series focus on the administrative skills associated with vocational education curriculum development and management.

- Module 12: Evaluating Vocational Education Curricula provides an overview of evaluation in vocational education, including the pre-implementation and implementation evaluation of curricula. This module presents information on planning the evaluation, developing measures, selecting a design and sample, conducting the evaluation, and processing and analyzing the data.

- Module 13: Conducting Follow-Up Studies and Communicating Evaluation Results summarizes the major activities included in planning and conducting a follow-up evaluation of former vocational students or their employers. The module also includes guidelines for interpreting and communicating the results of all types of vocational education evaluations.

- Module 14: Managing Vocational Education Programs describes a variety of management techniques including Management by Objectives, PERT, PPBS, the Delphi technique, the advocate team process, and Zero-Based Budgeting. The module also reviews the concept of educational accountability and discusses techniques for selecting instructors; providing equipment, facilities and supplies; scheduling; and preparing a budget.

- Module 15: Preparing for Curriculum Change defines terms commonly used in the study of change, discusses the characteristics of people most likely to accept change, and describes the types of innovative programs that are most easily accepted. The module also focuses on the general functions of the change agent and on the various stages of the change process.

- Module 16: Staff Development focuses on the planning, implementation, and evaluation of staff development activities for vocational educators. This module describes methods for determining staff development needs, creating staff development strategies, conducting activities, and evaluating results.

- Module 17: Knowledge Utilization describes a variety of techniques that a state level linkage agent from the department of vocational education can use to access curriculum networks and to increase the utilization of up-to-date curriculum in the local vocational classroom.

Each of the modules follows the same format. They all begin with an introduction that contains a brief overview of module content, instructions to the learner on how to use the self-check materials in the module, a listing of the goals and objectives addressed in the module, and a bibliographic reference for any outside resources needed to complete the learning activities in the module.

The text, which is divided into sections representing each major goal of the module, follows. The text synthesizes a significant amount of material and information into a concise content outline. Individual and group learning activities and discussion questions related to each goal are suggested.

The modules conclude with a summary and a series of appendices. The appendices include self-check questions and responses for each goal. In some modules, responses to individual study activities and discussion questions are also included. The last section in the appendices is always a list of recommended references for use by students and instructors who would like to pursue specific module topics in greater detail.[1]

Suggestions for Instructors

Training in curriculum development and management skills can be conducted by a wide spectrum of teacher training institutions through various traditional and nontraditional arrangements, or by local school districts or public agencies acting either independently or in cooperation with higher education institutions. The modules were designed to provide for maximum flexibility in their use. The possibilities for teaching and learning with the modules are numerous and diverse. In some form, the modules are appropriate for all instructional settings and teaching methods. Therefore, instructors are encouraged to view the module contents as suggestions rather than directives, and to adapt the modules as desired.

Because the modules can be used in different ways, instructors should become thoroughly familiar with the content of those they plan to use, and determine how the modules' contents will be incorporated into course outlines or lesson plans. Instructors should determine the emphasis to be placed on each of the goals and activities of the modules they will use. Instructors can assign all sections and activities, pick among them, or substitute others. These decisions should be based on students' needs, instructional objectives, and the schedule and duration of class meetings.

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[1] Sets of the modules are available from the East Central Network Curriculum Center, Sangamon State University E-22, Springfield, Illinois 62708.

Typically, students are asked to complete reading assignments and individual study activities prior to weekly group meetings. Then they discuss what they have learned, and plan or carry out group assignments during class. In some classes, each student may complete the same assignments. In other classes, students can be divided into groups that complete different assignments or parts of assignments. Some instructors may prefer to meet with students regularly, but not weekly. Small groups of students could then be encouraged to get together on alternate weeks, forming study groups on the basis of common backgrounds or interests, or simply because they lived near each other. Class sessions with the instructor present would become primarily a time for large-group discussions and for sharing individual papers or readings and the results of group activities.

Certain of the modules include updating suggestions, and general research procedures apply to keeping all of them current. Instructors who teach the foundations series of modules on the history and philosophy of vocational education, should make a special effort to keep informed of legislative developments by reading professional journals and newsletters. When new laws, regulations, or guidelines are issued, copies of them should be obtained from local sources or from elected representatives, government documents repositories (special libraries located across the country), or appropriate offices within a state's department of education.

Instructors should study the new documents and compare them with the ones they replace or amend. Most significantly, instructors should analyze the trends reflected in changes in laws, regulations, and guidelines, noting the forces that prompted their promulgation and the effects of the changes on vocational education at all levels of educational organization (local, regional, state, and national). The analysis could be presented to students in a lecture or summarized in a handout. Or, students could be assigned to conduct such an analysis as a module activity. In any case, it is important that recent legislative developments be incorporated into the modules in some manner.

Organization of instruction. Instruction with the modules can be organized according to any plan and can be conducted by instructors who favor any teaching strategy. For example, a module or modules can be used as a resource in preparing lectures, as a component of a seminar, or as the basis for a workshop. Team teaching by instructors representing major occupational areas is another way the modules may be used. Team teaching is one example of a method to tailor a course on curriculum development to particular fields of work. The modules may be used for independent study, either for college credit or for informal professional development.

In formal independent study arrangements, the modules are particularly appropriate for contract learning. Contracts to use specific modules, to do outside readings, and to carry out special studies relating to individual students' interests can be cooperatively developed between the instructor and the student. They should include clearly specified minimum requirements and time schedules. Contracts may also be used as a method for teaching individuals within a larger group to allow for different levels of interest, attainment, or rates of learning. Whenever the modules are used for independent study or individualized learning, convening students occasionally is a good idea, however. During such meetings, lectures by the instructor or by experts in specialized fields can supplement information provided in the module.

Regardless of how the modules are used, the instructor retains complete control over instructional content and process. The modules themselves, whether one, several, or all are used, can constitute the total instructional program; they can be supplemented with additional readings and activities; or they can be used to enrich existing curricula. The instructor can determine the emphasis placed on module contents and can choose the learning activities he or she assigns.

Suggestions for Administrators

There are probably as many potential ways to use the modules as there are programs to train vocational educators. In the national field test of the modules, conducted at 15 locations around the country, the sites were chosen to

represent the variety of users and uses anticipated for the modules (Claudy & Hamilton, 1981). For example, the field sites ranged from a state department of education to a military base, and included traditional and off-campus university courses. The students represented an equally wide variety, including undergraduate and graduate students working toward certification, practicing vocational teachers and administrators seeking inservice training, workers in industry wanting to teach their vocational skills, and state vocational education agency staff upgrading their abilities.

The following project descriptions show how five field test sites used the modules. These examples are included to illustrate to administrators concerned with the training and professional development of vocational educators how the modules might be used in their locations.

Virginia Polytechnic Institute and State University. During the 1980 spring term, faculty in the Division of Vocational and Technical Education used various modules as core materials for two off-campus courses that were part of an existing graduate program benefiting students more than 100 miles from the main campus. Classes met once every two weeks for communication and evaluation sessions. A three-credit hour survey course, Foundations of Vocational and Technical Education, was offered to secondary-level vocational teachers. Modules 2-6 were used as the basic resource. Additional readings that are noted in the modules were made available for student use. A second course, Curriculum Design and Development in Vocational and Technical Education, used the group of five modules covering the development of vocational education curricula and instructional strategies. Students in this course included secondary vocational teachers and community college instructors.

Although the courses were teacher-directed, the time between class meetings allowed students to read the assigned modules, to use additional resources, and to work on recommended or suggested individual and group activities. Students were encouraged to use their local public or college libraries to do topical research in periodicals, journals, and so on. A new module was introduced at each session, although students could request to take a test that exempted them from completing a given module if they passed.

Travis Air Force Base, Sacramento, California. An on-base vocational education program is operated by Southern Illinois University (SIU) for full-time military personnel. The Travis program has three features: (1) a weekend format compatible with the students' military responsibilities, (2) a system that grants college credit for certain military training, and (3) eight short, intensive professional education courses. Modules 2-6 were used as the core curriculum of a course on the principles and philosophies of vocational education. The course was part of SIU's existing Bachelor of Science Degree in Occupational Education. Classes were held for a total of seven hours each day of alternate weekends over an eight-week period. The instructor supplemented the modules with several activities he devised (Claudy, Hamilton, & McDonald, in press).

The military students at Travis have technical skills in occupational areas, but lack experience in or knowledge of vocational education in the civilian world. During the fall of 1979, the students enrolled in the course featuring modules 2-6 averaged 34 years of age, and had an average of 16 years of military service. Many of these students had served as military instructors and were working steadily toward a second career as a vocational instructor after retirement.

California State University, Sacramento, California. Experienced persons from trade or business who had become provisionally-certified vocational teachers and who were seeking course credits toward full vocational teacher certification used the modules in off-campus classes held in rural communities. Over the 1979-80 school year, classes met alternately at two different locations because students came from such a wide area in California's central valley. Three courses, taught by a part-time instructor, were offered: Scope and Function of Vocational Education, using modules 2-5; Curriculum, Instruction, and Evaluation for Occupational Subjects, covering modules 7-11; and Workshop in Occupational Studies, using modules 6 and 15.

Because students had entered teaching directly from their work experience, the instructor concentrated on class discussions and special written assignments based on each student's occupational area. Successful completers of the

courses earned credits toward a Designated Credential and, in some cases, toward a B.S. Degree in Vocational Education (Hamilton & Kaplan, 1979).

Oklahoma Curriculum and Instructional Materials Center. During the 1979-80 school year, staff members of the Curriculum and Instructional Materials Center (CIMC) used 16 of the modules for inservice training. Classes were held at the State Department of Vocational and Technical Education, and taught by the CIMC director. Those students who did not hold degrees in vocational education included support staff from clerical, library, and management positions. Their course work concentrated on modules 1-5, enabling them to acquire information about the legislation, history, organization, and scope of vocational education.

Students holding vocational education degrees were CIMC staff whose jobs involved instructional materials development. Whenever appropriate, their class work with the curriculum-centered modules 7-11 was related to the Center's responsibilities and practices. Modules 6 and 12-16 were used for a continuation of the inservice program for students with vocational education degrees. Class work included discussions of the modules' content and projects to develop instructional materials for individualized study, and for special populations such as the handicapped.

New Jersey State Department of Education. Field testing of various modules in two classes was arranged by the New Jersey State Department of Education during the 1979-80 school year. The first class was held at the New Jersey Curriculum Laboratory, Rutgers, the State University covering modules 1-6. The second class, which covered modules 7-11, was sponsored by Jersey City State College at an off-campus site. Meetings were held at the Monmouth County Area Vocational-Technical School. Both classes were attended by the same group of 15 students who were all graduate-level vocational instructors, department chairpersons or middle management school coordinators. Each had a working interest in the use of the modules for curriculum development in his or her respective school district. Both classes were taught by the principal of the Monmouth County Area Vocational-Technical School.

Since the field test, the modules have been used in courses offered by Rutgers University, Jersey City State College and Glassboro State College. Students at all three schools will receive graduate credit and a certificate of completion when they have finished all modules. When these courses have been offered for several semesters, it is anticipated that the three institutions will secure official approval for the program as a continuous offering. It is expected that they will also make a request to the State Board of Examiners to permit an addition on the teacher or administrator certificates of the students, endorsing them as vocational education curriculum specialists (Claudy, et al, 1981).

Suggested Target Populations

It is likely that the modules would be an appropriate addition to any vocational education professional development program, whether it is offered by a postsecondary educational institution or by an employer (Kaplan, Hamilton, & Wheeler, 1979). The following guidelines are included to suggest the types of students who would be likely to benefit most from each of the series of modules.

The foundations series, modules 2-6, are particularly appropriate for advanced undergraduate students in a vocational teacher/counselor preparation program, or for persons with occupational skills but no background in education who want to become vocational instructors. The foundation modules are also appropriate for graduate students at the master's degree level who have had minimal vocational education experiences.

The curriculum development and administrative series, modules 7-11 and 12-17, are appropriate for graduate students at the master's or doctorate level who are specializing in vocational education curriculum, instruction, or administration, or who are preparing for training positions in industry. The curriculum and administrative modules are also appropriate for use in inservice education programs for practicing vocational teachers or adminstrators, especially those programs arranged by the employing institution.

Several traditional vocational teacher preparation programs that participated in the national field test did not use even a whole series of modules, but rather included one or several modules as part of standard courses. Administrators who seek to use the modules in colleges with strict curriculum review procedures or in states with strictly mandated course requirements for vocational teacher certification or credentialing might consider this approach.

Leadership in an Era of Limits

The vocational education leaders who will direct us through the era of limits must be men and women who will challenge old assumptions about schools and vocational training, who will be willing to extend their creativity to the limit to find acceptable solutions to these difficult problems, and who will be secure enough as professionals to seek help from others outside their profession. Perhaps the single most important requirement of those who will lead in these new times is that they be able to respond rather than resist, that they see in this new era for vocational education new and positive possibilities.

If the era of limits forces us to reevaluate the very core of our educational system, to subject every aspect of it to the most vigorous scrutiny, the results can only be helpful. Institutions, like people, must renew themselves. It may well be that the external challenge presented by the era of limits will be the impetus to stimulate this needed process in our entire vocational education enterprise.

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